Claims

1.-18. (cancelled)

19. (new) A method of pre-emphasizing an optical multiplex signal comprising a plurality of signals having different wavelengths, the plurality of signals transmitted from a transmitter to a receiver, the method comprising:

determining an average power for the signals to be transmitted to the receiver;

determining a first current power of the signals at the transmitter;

determining a second current power of the signals at the receiver;

determining new power values from the first and second current powers and the average power; and

adjusting a transmitting power of the transmitter according to the new power values, wherein determining the new power values is based on equalizing signal-to-noise ratios of the signals received at the receiver.

20. (new) The method in accordance with claim 19, wherein adjusting the transmitting power is further based on spectral influences of a transmission link between the transmitter and the receiver.

21. (new) The method in accordance with claim 20, wherein the spectral influences include an influence chosen from the group consisting of amplification, noise influences and attenuation.

22. (new) The method in accordance with claim 19, wherein the plurality of signals is optically transmitted over N+1 optical amplifiers connected in series and having substantially equal amplification characteristics and over N transmission links connecting the N+1 optical amplifiers, and the new power values regarding at least one of the plurality of signals transmitted over the N+1 optical amplifiers are determined according to the following formula:

$$P_{IN}(\lambda)\_new := < P_{IN} > \cdot \frac{Q(\lambda)}{< Q(\lambda) >} \text{ \{in mW\}} ,$$

wherein $<P_{IN}>$ designates the average power of the at least one signal at the transmitter, and wherein, for tolerating a balance of the signal-to-noise ratios of the signals received at the receiver, the function $Q(\lambda)$ is defined as follows:

$$\frac{Q(\lambda)}{< Q(\lambda) >} = k\,\frac{f(\lambda)}{\lambda}\cdot\frac{1}{N+1}\cdot\frac{G_{LINK}-1}{G_{LINK}^{\frac{N}{N+1}}\cdot\left[G_{LINK}^{\frac{1}{N+1}}-1\right]},$$

wherein $G_{LINK}$ is the overall gain of a channel determined from the first and second current powers, $f(\lambda)$ is a spectral number function of the optical amplifiers, and K is a constant.

23. (new) The method in accordance with claim 22, wherein the function $Q(\lambda)/<Q(\lambda)>$ is approximated by $1/\sqrt{G_{LINK}}$.

24. (new) The method in accordance with claim 19, wherein normalized power spectra of the signal at the transmitter and at the receiver are inverse functions to each other.

25. (new) The method in accordance with claim 19, wherein the new power values are determined using the following formula:

$$P_{IN}(\lambda)\_new := < P_{IN} > \cdot\sqrt{\frac{P_{IN}(\lambda)}{P_{OUT}(\lambda)}}\cdot\sqrt{\frac{< P_{OUT} >}{< P_{IN} >}} \quad \{in\ mW\},$$

wherein the pointed brackets <...> designate an averaging of an argument over the bandwidth $\Delta\lambda$ of the signals, $P_{IN}(\lambda)$ designates the first current power, and $P_{OUT}(\lambda)$ designates the second current power.

26. (new) The method in accordance with claim 19, wherein the new power values are determined using the following formula:

$$P_{IN}(\lambda)\_new := < P_{IN} > \cdot\left(\frac{P_{IN}(\lambda)}{P_{OUT}(\lambda)}\right)^{k} / \left\langle\left(\frac{P_{IN}}{P_{OUT}}\right)^{k}\right\rangle \quad \{in\ mW\},$$

wherein the pointed brackets <...> designate an averaging of an argument over the bandwidth $\Delta\lambda$ of the signals, $P_{IN}(\lambda)$ designates the first current power, $P_{OUT}(\lambda)$ designates the second current power, and k designates a constant within the range $0<k<1$.

27. (new) The method in accordance with claim 26, wherein an optimum of the constant k is selected such that system-related deviations of the signal-to-noise ratios occur are minimized.

28. (new) The method in accordance with one of the claim 26, wherein the constant k is selected using a planning tool of a network management system or using measurements of the signal-to-noise ratios.

29. (new) The method in accordance with claim 19, wherein signal-to-noise ratios related to selected signals or groups of signals at the transmitter and at the receiver are determined for control purposes.

30. (new) The method in accordance with claim 19, wherein the transmitter and receiver comprise optical amplifiers.

31. (new) The method in accordance with claim 19, wherein the transmission links are part links of an optical network, and a pre-emphasis is executed for each part link.

32. (new) The method in accordance with claim 31, wherein the new power values at the transmitter of a part link is determined using the following formula:

$$P_{IN}(\lambda)\_new = (P_{IN}) \cdot \frac{G(\lambda)^{-k}}{\left\langle G(\lambda)^{-k} \right\rangle} \cdot \frac{OSNR^{IN}(\lambda)}{OSNR^{IPP}} \cdot \frac{h(\lambda)}{OSNR^{IN}(\lambda) \cdot \alpha - h(\lambda)},$$

wherein the optical signal-to-noise ratio value $OSNR^{PP}$ designates such constant signal-to-noise ratio which would be produced in standalone operation of the transmission link in the network, $G(\lambda)$ designates an wavelength-dependent gain of the transmission link, and $h(\lambda)$ designates a desired wavelength-dependent function of signal-to-noise ratios occurring at an end of the part link, wherein the parameter $\propto$ is selected such that the average power $<P_{in}>$ of channels at the input of the part link remains unchanged, and wherein $OSNR^{IN}(\lambda)$ designate wavelength-dependent signal-to-noise ratios at an input of the part link.

33. (new) The method in accordance with claim 19, wherein the plurality of signals are transmitted within a fully optical transparent network.

34. (new) The method in accordance with claim 19, wherein the plurality of signals are transmitted using a DWDM transmission, and spectral spacings between channels occupied by the signals are selected at 100 GHz or below.

35. (new) The method in accordance with claim 19, wherein an additional pre-emphasis of powers of the signals at the transmitter is used for adjusting measured signal-to-noise ratios at the receiver.

36. (new) The Method in accordance with claim 19, wherein a spectrum of the signal-to-noise ratios is determined and examined for a tilting or a non-linear deviations.

37. (new) The Method in accordance with claim 36, wherein the new power values are determined such that the detected tilting or non-linear deviation is compensated for.

38. (new) The method in accordance with claim 19, wherein at least one of the transmission links has a number of downstream optical amplifiers and optical wave guides, and the optical amplifiers are configured to be regulated such that an increase of an optical power spectrum at an input of each amplifier has a predetermined value.

39. (new) The method in accordance with claim 38, wherein this predetermined value corresponds to a tilt of a predetermined noise figure.